

RESERVE

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION.

### Device for Reducing Noise in Suction Apparatus of Textile Fabric Drying Machines, Paper-Making Machines or the like.

We, BOWATERS DEVELOPMENT AND RESEARCH LIMITED, a Company organised under the laws of Great Britain, of Bowater House, Stratton Street, London, W.1, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

In certain apparatus wherein material is subjected to suction whilst conveyed upon a perforated carrier which travels over and beyond a suction zone, considerable noise may be produced due to rapid rush of air into the evacuated holes of the carrier upon exit from the suction zone. This occurs, for example, in the suction rolls of paper making machinery and in suction machines which dry textile fabrics. In the former example a web of wet stock, supported on the wire or felt or like porous material, is carried on a rotating perforated hollow roll within which a suction box is mounted so that during a part of its travel with the roll the web is subjected to suction. As the air rushes into the holes in the roll when they emerge from the suction zone, a siren-like sound is emitted and this is one of the principal noise problems in paper mills. As machine speeds rise, the noise increases correspondingly, so that working conditions in modern high speed plant are far from satisfactory.

Efforts have been made to solve this problem of noise and it has been proposed to introduce into the suction rolls a silencer consisting of a curved baffle which is inclined with respect to the inside surface of the roll shell to provide an air gap which increases in cross-section area from the exit wall of the suction box to the remote edge of the baffle. The purpose of this is to cause air to enter the evacuated holes of the suction roll shell more gradually. However, it

is known that such a silencer is sensitive to variations of clearance and that to obtain the desired clearance along the whole length of the roll and then to maintain that clearance over a considerable period of time is difficult.

The object of the present invention is to provide a silencer, in apparatus of the kind hereinbefore mentioned, and particularly in hollow suction rolls of machines for making paper and the like, in which the control of the air passage is independent of initial clearance between the baffle and the perforated carrier or suction roll, and is practically unaffected by wear.

With this object in view the device according to the invention comprises a baffle formed and located so as to bear on the underside of the perforated carrier as it leaves the suction zone, and slotted so that each hole is progressively uncovered in its course over the baffle. In its application to suction rolls of paper making machines the baffle is arranged to bear on a segment of the inside of the shell of the roll extending from the exit wall of the suction box for a sufficient distance to ensure that each hole in the shell is uncovered in successive stages. Thus, for example, the baffle may extend over a segment which includes four or more longitudinal rows of holes in the roll.

To ensure that the baffle will always bear on the carrier or roll it is preferably made of resiliently flexible material, e.g. rubber, and mounted so that it will be sufficiently deformed in operation to bear with pressure on the carrier or roll.

In a preferred form the baffle slots are such that the baffle has trailing fingers narrowing in width as they extend away from the suction zone. Thus the slots may be V-shaped, widening in width towards the trailing edge of the baffle.

The baffle may be mounted in position in

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various ways. For example, it may be formed of angle-section of which one limb is the operative wiping part and the other serves for anchoring the device adjacent to the suction box, which device may be provided with means of longitudinal and other adjustment. The baffle device may be pivotally mounted so that it can be swung down into an inoperative position closer to the wall of the suction box and thus facilitate the endwise removal of the baffle and the suction box from the suction roll through the normal opening in an end wall of the roll. Alternatively the baffle may be moulded or formed integrally with the sealing element of the exit wall of the suction box.

An embodiment of the invention will now be described with reference to the accompanying drawings in which:—

Figure 1 is an elevation, partly in section, of the relevant portion of a suction roll equipped with a baffle device according to the invention.

Figure 2 is a fragmentary view of the baffle device looking in the direction of the arrow X shown in Figure 1.

Referring to the drawings, 1 indicates the perforated shell of a suction roll, some of the holes being indicated at 2. As shown in Figure 2 the holes are arranged in longitudinal rows, the holes of adjacent rows being staggered with respect to one another.

A resilient pad 3 forms a sealing element at one edge of a suction box positioned within the roll. This edge is the leaving edge in respect of the passage of the shell over the suction box, the shell rotating in the direction of the arrow Y. The pad 3 is supported in a carrier 4 which is in turn supported by and keyed in a longitudinal groove of the exit wall 5 of the suction box.

A silencing baffle of generally angle section and made of rubber is indicated generally at 6, the operative arm 7 of the angle bears against the inner surface of the suction roll shell while the other arm 8 is gripped in a mounting 9. The mounting 9 is pivoted about a shaft 10 and the mounting and baffle may be swung to the position indicated in dotted lines in Figure 1 to facilitate the removal of the baffle and suction box through an end of the roll.

Figure 2 shows that the baffle is formed so that its operative portion 7 comprises a number of fingers with slots between them. Each finger 11 tapers in width and depth from its root to the trailing edge of the baffle, while the root ends merge into a solid part 12. The slots correspondingly widen towards the trailing edge. The baffle is suitably provided with the same number of slots as there are holes in each row.

In operation each hole of one row as it passes over the baffle will proceed along a slot from the narrow end thereof to the wider

end at the trailing edge of the baffle so that it is gradually uncovered from its centre, whilst each hole of the next row will pass over a finger of the baffle so that it is gradually uncovered from the circumference towards the centre.

It will be appreciated that this is only one example of an arrangement according to the invention and that the baffle may have more or less slots than there are holes in each row.

It will also be appreciated that the device according to the invention does not require careful setting to ensure a definite clearance and that no problem arises as to maintaining a clearance in the course of prolonged operation of the machine. By making the baffle of rubber or like material the rate of wear is small, especially since water which is present forms a good lubricant between rubber and the metal of which suction rolls in paper mills are made.

What we claim is:—

1. In apparatus wherein material is subjected to suction whilst conveyed upon a perforated carrier which travels over and beyond a suction zone, and wherein noise is produced due to rapid rush of air into the holes of the carrier upon exit from the suction zone, a device for reducing the noise comprising a baffle formed and located so as to bear on the under side of the carrier at the exit from the suction zone, and slotted so that holes in the carrier are progressively uncovered in a continuous manner in their course over the baffle.

2. In a machine for making paper and the like wherein a web of wet stock, supported on felt or like porous material is carried on a perforated hollow roll within which a suction box is mounted so that during a part of its travel the web is subjected to suction, a device for reducing noise due to rapid rush of air into the holes in the roll when they pass the exit wall of the suction box, said device comprising a baffle formed and located so as to bear on a segment of the inside wall of the roll extending from the exit wall of the suction box, and slotted so that holes in the roll are progressively uncovered in a continuous manner in their course over the baffle.

3. A device as claimed in Claim 1 or 2 in which the baffle is made of resiliently flexible material e.g. rubber and is mounted so as to bear with pressure on the carrier or roll.

4. A device as claimed in Claim 1, 2 or 3 in which the baffle slots are provided by forming the baffle with trailing fingers narrowing in width as they extend from the suction zone.

5. A device as claimed in Claim 4 in which the slots are V-shaped widening in width in their extent away from the suction zone.

6. A device as claimed in any of Claims 1-5 in which the baffle is of generally angle section, one limb of which is the operative part and the other limb is for anchoring the baffle to a mounting adjacent to the exit wall of the suction zone.

7. A device as claimed in Claim 2 or in Claim 2 and in any of Claims 3-6 in which the baffle is pivotally mounted so that it may be swung down into an inoperative position closer to the wall of the suction box to facilitate the endwise removal of the baffle and the suction box from the suction roll.

8. A device as claimed in Claim 2 or in Claim 2 and any of Claims 3-5 in which the

baffle is formed integrally with the exit wall of the suction box.

9. A device as claimed in Claim 2 or in Claim 2 and any of Claims 3-8 in which the baffle extends over a segment of the roll including four or more longitudinal rows of holes in the roll.

10. A device for reducing the noise in suction rolls substantially as described and as shown in the accompanying drawings.

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#### PROVISIONAL SPECIFICATION.

#### Device for Reducing Noise in Suction Apparatus of Textile Fabric Drying Machines, Paper-Making Machines or the like.

We, BOWATERS DEVELOPMENT AND RESEARCH LIMITED, a Company organised under the laws of Great Britain, of 9 Park Place, St. James, London, S.W.1, do hereby declare this invention to be described in the following statement:—

In certain apparatus wherein material is subjected to suction whilst conveyed upon a perforated carrier which travels over and beyond a suction zone, considerable noise may be produced due to rapid rush of air into the evacuated holes of the carrier upon exit from the suction zone. This occurs, for example, in the suction rolls of paper making machinery and in suction machines which dry textile fabrics. In the former example a web of wet stock, supported on the wire or felt or like porous material, is carried on a rotating perforated hollow roll within which a suction box is mounted so that during a part of its travel with the roll the web is subjected to suction. As the air rushes into the holes in the roll when they emerge from the suction zone, a siren-like sound is emitted and this is one of the principal noise problems in paper mills. As machine speeds rise, the noise increases correspondingly, so that working conditions in modern high speed plant are far from satisfactory.

Efforts have been made to solve this problem of noise and it has been proposed to introduce into the suction rolls a silencer consisting of a curved baffle which is inclined with respect to the inside surface of the roll shell to provide an air gap which increases in cross-section area from the exit wall of the suction box to the remote edge of the baffle. The purpose of this is to cause air to enter the evacuated holes of the suction roll shell more gradually. However, it is known that such a silencer is sensitive to variations of clearance and that to obtain the desired

clearance along the whole length of the roll and then to maintain that clearance over a considerable period of time is difficult.

The object of the present invention is to provide a silencer, in apparatus of the kind hereinbefore mentioned, and particularly in hollow suction rolls of machines for making paper and the like, in which the control of the air passage is independent of initial clearance between the baffle and the perforated carrier or suction roll, and is practically unaffected by wear.

With this object in view the device according to the invention comprises a baffle formed and located so as to bear on the underside of the perforated carrier as it leaves the suction zone, and slotted so that each hole is progressively uncovered in its course over the baffle. In its application to suction rolls of paper making machines the baffle is arranged to bear on a segment of the inside of the shell of the roll extending from the exit wall of the suction box for a sufficient distance to ensure that each hole in the shell is uncovered in successive stages. Thus, for example, the baffle may extend over a segment which includes four or more longitudinal rows of holes in the roll.

To ensure that the baffle will always bear on the carrier or roll it is preferably made of resiliently flexible material, e.g. rubber, and mounted so that it will be sufficiently deformed in operation to bear with pressure on the carrier or roll.

In a preferred form the baffle slots are such that the baffle has trailing fingers narrowing in width as they extend away from the suction zone. Thus the slots may be V-shaped widening in width towards the trailing edge of the baffle.

The baffle may be mounted in position in various ways. For example, it may be

formed of angle-section of which one limb is the operative wiping part and the other serves for anchoring the device adjacent to the suction box, which device may be provided with means of longitudinal and other adjustment. The baffle device may be pivotally mounted so that it can be swung down into an inoperative position closer to the wall of the suction box and thus facilitate the endwise removal of the baffle and the suction box from the suction roll through the normal opening in an end wall of the roll. Alternatively the baffle may be moulded or formed integrally with the sealing element of the exit wall of the suction box.

It will be appreciated that the device according to the invention does not require careful setting to ensure a definite clearance and that no problem arises as to maintaining a clearance in the course of prolonged operation of the machine. By making the baffle of rubber or like material the rate of wear would be small, especially since water which is present forms a good lubricant be-

tween rubber and the metal of which suction rolls in paper mills are made.

In the normal construction of suction rolls in paper mills the holes of adjacent rows are staggered with respect to one another. Accordingly the baffle of the invention is suitably provided with the same number of slots as there are holes in each row. Each hole of one row as it passes over the baffle will then proceed along a slot from the narrow end thereof to the wider end at the trailing edge of the baffle so that it is gradually uncovered from its centre, whilst each hole of the next row will pass over a finger of the baffle so that it is gradually uncovered from the circumference towards the centre. It will be appreciated that this is only one example of an arrangement according to the invention and that the baffle may have more or less slots than there are holes in each row.

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